In The Specification:

On page 2, please replace the first full paragraph as follows:

This application is related to the following co-pending United States patent applications, which further describe certain elements and aspects of the FTTH Multimedia Access System set forth herein: (1) S/N 09/520587~~/~~______, titled "Splice Tray for use in Splicing Fiber Optic Cables and Housing Therefor," filed on March 8, 2000; ~~(2) S/N __/______, titled "Horizontally Mounted Splitter Wavelength Division Multiplexed Frame (HSWX)," filed on March (Day), 2000; (3) S/N __/______, titled "DBS CATV Transmitter (DCX)," filed on March (Day), 2000;~~ ~~(4)~~ (2) S/N 29/120491 ~~—/~~______, titled "Wall-Mounted Home Network Unit," filed on March 20, 2000; ~~(5) S/N __/______, titled "Mechanical Design of HNU," filed on March (Day), 2000;~~ (3) ~~(6)~~ S/N 09/395,844, titled "Apparatus and Method for Extracting Two Distinct Frequency Bands from Light Received by a Photodiode," filed on September 14, 1999; and (4) ~~(7)~~ S/N 09/539305 ~~—/~~______, titled "Digital Laser Driver Circuit," filed on March 31~~(Day)~~, 2000. The teaching and disclosure of these co-pending applications are hereby incorporated into this application by reference.

On page 18, please replace the first full paragraph as follows:

The HNU 50 is preferably mounted on a wall inside the living unit. The HNU housing is preferably a "clam shell" box with a hinged cover providing access to the circuit board and fiber loop inside the unit. A lock is provided to prevent unauthorized entry to the HNU. ~~Mechanical~~

~~schematics of the preferred HNU 50, and corresponding description are set forth in co-pending application S/N __/______, titled "Mechanical Design of HNU," the teaching of which has been incorporated into this application by reference.~~

On page 18, please replace the second full paragraph as follows:

The fiber drop cable 48, including an optional metallic strength member, enters the HNU 50 housing. The mechanical termination of the fiber cable 48 and optional strength member is provided as an integral part of the HNU 50 housing. The fiber drop 48 termination is provided jointly by the HNU 50 unit mechanics and the HNU 50 circuit board. The HNU 50 hinged cover contains an integrated fusion splice tray where the fiber drop to the home is spliced into the HNU internal fiber loop. The HNU internal fiber loop is then terminated on the HNU circuit board. A further description of this fiber splice tray is seen in co-pending application S/N 09/520587 ~~__/______~~, titled "Splice Tray for use in Splicing Fiber Optic Cables and Housing Therefore," the disclosure of which has been incorporated into this application by reference.

On page 19, please replace the first paragraph as follows:

The POTS, video and Ethernet data are provided as connectorized outputs on the HNU 50 housing. Three RJ11 connectors are provided for connection to the house telephone wiring. Each connector provides a separate, private line. Two ' F' type connectors are provided for video feeds into the customer premise. One connector provides the CATV signal and the other

provides the digital DBS signal. A single RJ45 connector is provided for a ~~10Base "__" T~~ 10Base-T high-speed data connection to the customer's computer.

On page 19, please replace the past paragraph that continues on page 20, as follows:

HNU data traffic is received and transmitted as Ethernet packets using Point-to-Point Protocol over Ethernet (PPPoE). The ~~10Base "__" T~~ 10Base-T interface provided at the HNU 50 is IEEE 802.3 compliant. The HNU 10Base-T interface is connected to a standard Network Interface Card (NIC) installed in the customer's computer over CAT-3 or CAT-5 cabling in the home. The PPPoE session is initiated at the customer's computer and terminated by the ISP provider. The high-speed data service downstream performance is 20Mbps shared among four homes connected at the Passive Optical Splitter 46 with downstream burst capability of 10Mbps to each home. The upstream performance is 4.5Mbps dedicated for each home. All four of the homes linked to the Passive Optical Splitter 46 have the ability to conduct simultaneous 4.5Mbps data sessions.

On page 22, please replace the last paragraph as follows:

The 1310nm optical signals 28 received by the QOIU81 cards 20A in the MDS shelf also include Ethernet data packets from the HNUs 50. In similar fashion to the voice traffic, the QOIU81 20A removes the data packets from the digital signals derived from optical to electrical conversion of the signals received from all four fibers terminated at the card. The QOIU81 20A multiplexes the Ethernet data packets onto a single ~~100Base "__" T~~ 100Base-T output 20G. The

1~~00Base "__" T~~ 100Base-T output 20G carries data traffic from 16 homes consisting of up to 4 PPPoE sessions each. ~~The 100Base "__" T~~ 100Base-T signal from each QOIU81 20A is connected to an external Data Aggregation device 22 over CAT-5 wiring in the CO.

On page 25, please replace the first paragraph as follows:

The SWX element 30 is an optical distribution system. It includes WDMs that combine the 1310 nanometer signal 28 from the QOIUs 20A with a 1550 nanometer optical video signal 32 from the FOA 38E into one combined optical signal to feed the fibers 44 going out towards the subscribers. In addition, the SWX 30 includes a 1-for-32 splitter for the 1550 nanometer signal in order to share it over multiple fibers 44. ~~The structure and operation of the SWX are described in more detail in co-pending application S/N __/______, titled "Horizontally Mounted Splitter Wavelength Division Multiplexed Frame (HSWX)," the disclosure of which has been incorporated into this application by reference.~~

On page 25, please replace the second paragraph as follows:

The bottom left-hand corner of FIG. 3 shows the CO circuitry for interfacing with sources of analog/digital broadcast TV (i.e. CATV, VOD, etc.) and DBS signals 40, 42 (the optical video distribution circuitry). These signals 40, 42 are input to a CDX 38A. The CDX 38A is a CATV-DBS transmitter. The CDX 38A combines the CATV and DBS signals 40, 42 into a combined optical video signal at 1550 nanometers, which is subsequently distributed to a large number of HNUs 50. ~~The structure and operation of the CDX are described in more detail~~

~~in co-pending application S/N __/______, titled "CATV DBS Transmitter (CDX)," the disclosure of which has been incorporated into the present application by reference.~~

On page 29, please replace the last paragraph that continues on page 30 as follows:

The fiber drop cable 48, including an optional metallic strength member, enters the HNU 50 housing. The mechanical termination of the fiber cable 48 and optional strength member is provided as an integral part of the HNU 50 housing. The fiber drop 48 termination is provided jointly by the HNU 50 unit mechanics and the HNU 50 circuit board. The HNU 50 hinged cover contains an integrated fusion splice tray where the fiber drop to the home is spliced into the HNU internal fiber loop. The HNU internal fiber loop is then terminated on the HNU circuit board. A further description of this fiber splice tray is seen in co-pending application S/N 09/539395 ~~__/______~~, titled "Splice Tray for use in Splicing Fiber Optic Cables and Housing Therefore," the disclosure of which has been incorporated into this application by reference.

On page 30, please replace the first full paragraph as follows:

The echo cancellation portion of the circuit includes receiver photodiode 92, amplifier 102, and associated circuitry 104, 108, 110, a RISC processor 112, an echo canceller clock 70B in the digital FPGA 70, and a filter 94, 96, ~~98~~. The echo canceller circuit generates a signal that emulates the near and cross-talk signal (NEXT) and provides a cancellation signal into the negative input of the amplifier 102, thus compensating for the near end cross talk.

On page 31, please replace the second full paragraph as follows:

FIG. 7 is a data protocol diagram showing a full-duplex Passive Optical Network (PON) protocol with TDMA return methodology for use with the system of the present invention. The top portion 120 of the drawing shows the downstream transmission from the central office equipment 12 to the HNUs 50. This downstream transmission preferably operates at 25 Mbps (with 20 Mbps payload) and is 8B10B encoded to provide packet delineation and also to minimize baseline wander. The downstream protocol includes a 1.6 µs ~~us~~ long burst ID 120A, which contains information that instructs each HNU (of the 4 in a group) which upstream return slot to use for transmission. The remainder of the downstream protocol is a 205.2 µs ~~us~~ long data stream 120B. The Burst ID 120A also may include information that indicates which home network units 50 are active so as to minimize the chance for interference in the upstream data path between the HNUs 50 in a group, particularly when a new HNU 50 is connected to the fiber network for the first time.

On page 31, replace the last paragraph that continues on page 32, as follows:

Each home network unit 50 senses the Burst ID in the data protocol so as to know which upstream time slot (of the four) to communicate in within the upstream TDMA data stream, and also to know which other HNUs 50 in the group are active. Information regarding which HNUs 50 in the group are enabled and transmitting in the TDMA frame is important in the event that a new HNU 50 is connected to the passive optical network. In this situation, the newly attached HNU 50 looks first to see whether other HNUs 50 are active in the group of 4, so that the new HNU 50 won't start transmitting on any of their time slots. The four HNUs 50 in a group share

an 827.2 <u>µs</u> ~~us~~ payload 122 consisting of four burst payloads, one from each of the four HNUs 50. The burst payload includes a preamble 122A that provides clock recovery and symbol synchronization, followed by the HNU data 122B, and then a post amble 122C, which indicates when a particular HNU 50 has finished transmitting in its time slot. Some guard time is provided between the post-amble 122C of one HNU time slot and the preamble 122A of the next time slot. The guard time can be kept relatively short in the present invention (preferably about 13 microseconds) since the 4 HNUs 50 are preferably within 1km of the 1:4 splitter 46. By keeping the 4 HNUs 50 within a kilometer of each other, their signal delay relative to each other is less than 10 microseconds, and thus only 13 microseconds of guard time is needed between transmissions.

On page 33, replace the first full paragraph as follows:

The common FPGA 134 is coupled to the DPU 20B in the MDS shelf 20F, and handles all the telephony processing, including the voice packetization, etc. Voice communication, alarms, and management and provisioning are handled through the drop processor unit 20B. The data FPGA 132, communicates to a 100 Base-T PHY circuit 144, which is the fast Ethernet interface to the Ethernet switch 22. The data FPGA interfaces to the 100 Base-T PHY 144, and it aggregates packets coming from all 16 HNUs 50 upstream through the four E/O transceiver blocks 142. The Data FPGA 132 includes a separate upstream buffer for each of the 16 HNUs 50 in a high-speed 128k by 36 synchronous RAM 140. The Data FPGA 132 also includes a separate downstream buffer for each HNU 50. In this manner, the Data FPGA 132 takes data from the 100 Base-T PHY interface <u>144</u> ~~155~~, buffers it up for each of the fibers and sends it to

the fibers as fast as it can, and it takes data from the 16 HNUs 50, puts it all together, and prioritizes it, and sends it out over the 100 Base-T PHY 144 to the Ethernet switch 22.

On page 34, replace the last paragraph that continues on page 35, as follows:

As described in more detail in co-pending application S/N~~s~~ 29/120491 ~~—/———~~, titled "Wall-Mounted Home Network Unit~~,~~" ~~and __, ______, titled "Mechanical Design of HNU",~~ the HNU 50 is a plastic housing that includes a plurality of media connections configured along a bottom edge of the housing. An external power supply is provided that connects to an AC output and converts the 120 VAC power level into a 12VDC signal to power the electronics in the HNU 50. The external power supply may also include an optional 9VDC battery backup, which provides telephony power in the event of a power failure. The HNU 50 preferably includes a plurality of LEDs that provide an indication of the status of the device, such as whether there has been an error, or whether the unit is operating normally. Inside the HNU 50 is a single circuit card that is snap-fit into the unit, and thus requires no fasteners. This type of construction makes it very simple to upgrade the HNU 50 to other or more powerful multi-media services in the future. The single circuit card holds the circuitry shown in FIG. 9. A fiber splicing tray is mounted in the lid of the HNU housing, as shown and described in more detail in co-pending application S/N 09/520587 ~~—/———~~, titled "Splice Tray for use in Splicing Fiber Optic Cables and Housing Therefor." An input fiber 48 is routed into the HNU 50, coupled to the fiber splicing tray and fiber 174, and then coupled to the QuPlexer module 52 mounted on the circuit card.

On page 47, replace the last paragraph that continues on page 48, as follows:

FIG. 16B sets forth the methodology 370 of manually selecting an HNU timeslot. If the HNU 50 is trying to communicate on a timeslot that is already associated with another HNU 50, then the method shown in FIG. 16A will result in the HNU 50 turning on its clear LED to indicate that it is not communicating. Using some type of pushbutton 336, switch, or other type of signal generator, a user or installation specialist can cause the HNU 50 to select one of the other four timeslots. When the pushbutton 336 is depressed, an interrupt is generated at step 372. This pushbutton interrupt causes the HNU 50 to cycle to the next clear timeslot at step 374. This next timeslot is then stored in the HNU memory as its new default timeslot 376. At step 378 the HNU 50 is enabled to communicate on the new timeslot, at step 380 the correct LED indicator for that timeslot is illuminated, and at step 382, the timer interrupt is disabled. Control then passes to step 384, where the HNU 50 is waiting for another pushbutton interrupt to occur.